

REMARKS

Claims 1-6, 11-28, 38, 39, 46, 58, and 59 have been examined, and claims 7-10, 29-37, 40-45, and 47-57 have been withdrawn from consideration for being drawn to a non-elected species. Also, new claims 69-71 have been added and the withdrawn claims have been cancelled to avoid any excess claims fees.

I. Objection to the Drawings

The Examiner has objected to the claims under 37 C.F.R. § 1.83(a) for not showing every feature of the claimed invention. Specifically, the Examiner maintains that the features of claims 6 and 15 regarding *the movable membrane arranged in parallel to a vertical plane parallel to a direction in which the carriage is moved (claim 6) and parallel to a direction in which the carriage is moved and in parallel to a vertical place (claim 15)* are not shown in any of the drawings. It appears that the Examiner's reference to "claim 6" is a mistake. The language to which the Examiner maintains is absent from the drawings is actually the language from claim 5.

Applicant submits that this feature is in fact shown in Figure 12. Referring to Figure 12, ^{not elected species} it can be easily seen that the movable membrane 104 is in fact arranged parallel to a vertical plane parallel to the directing in which the carriage is moved. This is further explained in the specification at page 20, line 5 to page 22, line 18. Accordingly, Applicant respectfully requests that the objection to the drawings be reconsidered and withdrawn.

II. Objection to Specification

The Examiner has objected to the specification based on two informalities. Applicant has amended the specification in the manner suggested by the Examiner to correct the informalities. Accordingly, Applicant respectfully requests that the objection to the specification be reconsidered and withdrawn.

III. Claim Objection

The Examiner has objected to claim 11 based on informality. Applicant has amended claim 11 to correct the informality in the manner suggested by the Examiner. The scope of the claim has not been narrowed. Accordingly, Applicant respectfully requests that the objection to claim 11 be reconsidered and withdrawn.

IV. Claim Rejections under 35 U.S.C. § 112(2)

Claims 1-6, 11-28, 38-39 and 46 stand rejected under 35 U.S.C. § 112(2) as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner has specifically rejected claims 1, 2, 4, 6, 12, 16, 17, 18, 25 and 46 and the remaining claims were rejected by virtue of their dependency from at least one of the claims specifically rejected. Each rejection will be dealt with individually below.

A. Claim 1

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The Examiner has rejected claim 1 under 35 U.S.C. § 112(2) for not positively reciting the terms “a carriage” and “a valve seat.” Applicant has amended claim 1 to positively recite the above terms. The scope of the claim has not been narrowed since these elements were within the claim originally and the purpose of this claim amendment was only to positively recite these elements. Accordingly, Applicant respectfully requests that the rejection to claim 1 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

B. Claim 2

Claim 2 stands rejected under 35 U.S.C. § 112(2) for not positively reciting the term “a container.” Claim 2 has been amended to eliminate the use of the term “container” as it is not needed and as such, Applicant submits that the scope of the claim has not been narrowed. Accordingly, Applicant respectfully requests that the rejection to claim 2 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

C. Claim 4

The Examiner has rejected claim 4 under 35 U.S.C. § 112(2) for lack of proper antecedent basis for the term “said containers.” However, based on the amendment to claim 2, the term container has been eliminated in favor of the term “ink supply device.” Applicant has amended claim 4 to keep consistency between the claims but has not narrowed the scope of the claim 4 in any way. Accordingly, Applicant respectfully requests that the rejection to claim 4 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

D. Claim 6

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Claim 6 stands rejected under 35 U.S.C. § 112(2) for not positively reciting the term “a casing.” Applicant has replaced the term “casing” with “body” which was properly recited in claim 1 from which claim 6 depends.

Further, the Examiner is unclear how “a main tank” can be installed on a side that has not been previously defined. Finally, the Examiner is unclear where the ink or the conduit comes from. Applicant has amended claim 6 to more clearly recite that the main tank is installed on the body and a conduit is adapted between the main tank and the ink supply device. Accordingly, Applicant respectfully requests that the rejection to claim 6 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

E. Claim 12

Claim 12 stands rejected under 35 U.S.C. § 112(2) for not positively reciting the term “an ink supply port.” Applicant has amended claim 12 to positively recite the ink supply port. Since the claim originally contained this term, the amended claim has not been narrowed in scope. Applicant respectfully requests that the rejection to claim 12 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

F. Claim 16

Claim 16 stands rejected under 35 U.S.C. § 112(2) because the Examiner maintains that it is unclear what the difference is between “a disc-like elastic membrane member” recited in claim 16 and “a movable membrane” recited in claim 12, from which claim 16 depends. Similarly, the Examiner is unclear as to the difference between “a coil spring” in claim 12 and claim 16.

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Regarding the membrane member, Applicant submits that the claims refer to the same element but in claim 16, the membrane is further defined as being disc-like and elastic. Therefore, claim 16 has been amended to make it clear that claim 16 is limiting the physical characteristics of the membrane member of claim 12.

Regarding the coil spring, Applicant submits that the claims refer to the same element but in claim 16, the coil spring's location within the differential pressure valve is further defined. Therefore, claim 16 has been further amended to clarify this point. Accordingly, Applicant respectfully requests that the rejection to claim 16 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

G. Claim 17

Claim 17 stands rejected under 35 U.S.C. § 112(2) for not positively reciting the term "a holder." Applicant has amended claim 17 to positively recite the holder without narrowing the scope of the claim. Accordingly, Applicant respectfully requests that the rejection to claim 17 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

H. Claim 18

Claim 18 stands rejected under 35 U.S.C. § 112(2) for having the proper antecedent basis for the term "said casing." Applicant has amended claim 18 to replace the term "casing" with "container." Therefore, the claim does in fact possess proper antecedent basis. Accordingly, Applicant respectfully requests that the rejection to claim 18 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

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I. Claim 25

Claim 25 stands rejected under 35 U.S.C. § 112(2) because the Examiner maintains that it is unclear as to the difference between “a movable part” as recited in claim 25 and the one recited in claims 22 and 24 from which it depends. Applicant has amended claim 25 to be solely dependent from claim 12. Accordingly, Applicant respectfully requests that the rejection to claim 25 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

J. Claim 46

Claim 25 stands rejected under 35 U.S.C. § 112(2) because the Examiner maintains that it is unclear how the film member can be both gas permeable and repellent simultaneously. Applicant submits that, as explained in the specification, the film member has extremely low gas permeability and as such it would provide repellent properties to things such as solids, liquids and ink. Consequently, the film member can allow gas to permeate while still repelling ink. Accordingly, Applicant respectfully requests that the rejection to claim 46 under 35 U.S.C. § 112(2) be reconsidered and withdrawn.

V. Claim Rejections under 35 U.S.C. § 102(e)

Claims 1-6, 12-15, 17-21 and 46 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Iida (U.S. Patent No. 6,000,788). Applicant traverses this rejection based at least on the following discussion.

To be an “anticipation” rejection under 35 U.S.C. § 102, the reference must teach every element and limitation of the Applicants’ claims. Rejections under 35 U.S.C. § 102 are proper

only when the claimed subject matter is identically disclosed or described in the prior art. Thus the reference must clearly and unequivocally disclose every element and limitation of the claimed invention.

The references relied on by the Examiner fail to disclose every element and limitation of the claimed invention. Specifically, with regards to independent claims 1 and 12, the reference fails to disclose a coil spring that forces the movable membrane into the valve seat. Said differently, the reference does not show the coil spring contacting the movable membrane thereby resulting in the movable membrane contacting the valve seat.

The reference only discloses the coil spring 21 contacting the valve body 20, thereby forcing the valve body 20 to contact the membrane 3. In the reference, the valve body 20 is moved back and forth while in the present invention, the valve seat 57c is fixed and is not moved. Further, in the reference, the coil spring 21 contacts the valve body 20 and does not contact the membrane 3 while in the present invention, the coil spring 51 contacts the movable membrane 54 and does not contact the valve seat 57c. Therefore, since the reference fails to disclose the coil spring contacting the movable membrane thereby causing the movable membrane to contact the valve seat, we believe that the reference does not anticipate the present invention.

V. Claim Rejections under 35 U.S.C. § 103(a)

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Iida in view of Ims (U.S. Patent No. 5,136,305). Claims 22-28 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iida. Finally, claims 38-39 stand rejected under 35 U.S.C. § 103(a) as

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being unpatentable over Iida in view of Fong et al (U.S. Patent No. 5,280,300). Applicant submits that in light of the discussion above, dependant claims 11, 22-28 and 38-39 are allowable at least by virtue of their dependency from independent claims 1 and 12.

VI. Allowable Claims

The Examiner has allowed claims 58 and 59. Furthermore, the Examiner has stated that claim 16 contains allowable subject matter and would be allowed if rewritten to overcome the 35 U.S.C. § 112(2) rejections and rewritten in independent form. Since claim 16 has been rewritten in independent form and since it has also been amended to overcome the rejections under 35 U.S.C. § 112(2), Applicant submits that claim 16 is now in allowable form.

VII. Conclusion

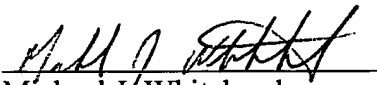
Reconsideration and allowance of all claims are respectfully requested in view of the following remarks. In view of the foregoing, the claims are now believed to be in form for allowance, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

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Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The specification is changed as follows:

On page 8, please delete the second full paragraph and replace it with the following paragraph:

Fig. 2 shows an embodiment of the ink supply unit 3. The ink supply unit 3 is in the form of a flat container, which is formed on its upper surface ~~21~~20 with the ink inlet 9 communicating with an ink storage chamber, and an air open port 21. An ink supply port 23 connected to the recording head 4 is formed in a lower area, on the lower surface 22 in this embodiment. A window is formed in an area, facing the ink storage chamber 36, of the side 24 of the container, and is sealed by a film 31. The film 31 is deformable with pressure of ink, and made of a laminated film in which a metallic layer having extremely low vapor permeability and extremely low gas permeability is laminated on a high polymer film, a high polymer film having extremely low vapor permeability and extremely low gas permeability, or the like.

On page 14, please delete the first full paragraph and replace it with the following paragraph:

When printing is started in this state and ink is consumed by the recording head 94, pressure in the groove 44 forming the ink passage is decreased to maintain ink supplied to the recording head ~~94~~ at fixed negative pressure. As ink is further consumed, negative pressure is

increased. Therefore, differential pressure acting on the membrane part 54 is increased as shown in Fig. 6(b), the membrane part 54 retracts against the spring 51 to separate the ink flow port 54a from the valve seat 57c, thereby forming a gap g.

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) An ink-jet recording device comprising:

a body;

a carriage movable relative to the body,

an ink-jet recording head provided to a said carriage, and

an ink supply means-device mounted to said carriage for supplying ink to said recording head, wherein:

said ink supply ~~means-device~~ is constructed as a differential pressure valve including a coil spring, a valve seat and a movable membrane normally contacted elastically with a said valve seat by said coil spring.

2. (Amended) ~~An~~ The ink-jet recording device according to Claim 1, wherein:

said ink supply ~~means-device~~ is ~~built in a container~~ mountable to said carriage and provided with an ink storage area.

4. (Amended) ~~An~~ The ink-jet recording device according to Claim 2, wherein:

said movable membrane is arranged in parallel to a plane perpendicular to a direction in which said carriage is moved; and

a plurality of ~~said containers~~ ink supply devices are mounted to said carriage and arranged adjacent to one another in the direction in which said carriage is moved.

6. (Amended) ~~An~~ The ink-jet recording device according to Claim 2, wherein:

a main tank having ink is installed on a the body ~~side of the casing~~; and

a conduit adapted between said main tank and said ink supply device conveys ink is supplied from said main tank to said container-ink supply via a conduit device.

11. (Amended) ~~An~~ The ink-jet recording device according to Claim 2, wherein:

said ~~container-ink supply device~~ is provided with an ink injection port; and

an ink supplementing ~~means device~~ is provided within ~~an~~ a range where said carriage is moved and in a non—printing area, said ink supplementing ~~means device~~ being detachably contacted with said ink injection port for injecting ink.

12. (Amended) An ink supply unit, ~~wherein~~ comprising:

a differential pressure valve including a coil spring and a movable membrane normally contacted elastically with a valve seat by said coil spring, is accommodated in a container having an ink storage chamber and an ink supply port;

wherein the ink storage chamber communicating communicates with an the ink supply port; and

wherein the ink supply port is adapted to be connected to an ink-jet recording head.

16. (Amended) An ink supply unit ~~according to claim 12,~~ comprising:

a differential pressure valve including a coil spring and a movable membrane normally contacted elastically with a valve seat by said coil spring is accommodated in a container having an ink storage chamber and an ink supply port;

wherein the ink storage chamber communicates with the ink supply port;

wherein the ink supply port is adapted to be connected to an ink-jet recording head;

wherein said differential pressure valve movable membrane is includes a disc-like elastic membrane member formed at its a center of said differential pressure valve with an ink flow port;

wherein a said valve seat is located in on an upstream side of ink flow and facing said ink flow port; and

wherein ~~asaid~~ coil spring is located ~~in-on~~ a downstream side and pressing said ink flow port of said ~~elastic-movable~~ membrane ~~member~~ onto said valve seat.

17. (Amended) ~~An~~ The ink supply unit according to Claim 12, wherein:
a spring holder is disposed between said coil spring and said movable member; and
wherein said movable membrane receives pressure of said coil spring via ~~a~~ the spring holder.

18. (Amended) ~~An~~ The ink supply unit according to Claim 12, wherein:
said ~~easing~~ container includes a frame-like casing provided at its side surface with a window, and an air intercepting film sealing said window.

25. (Amended) ~~An~~ The ink supply unit according to Claim 12, ~~22 or 24~~, wherein:
said movable membrane is provided with a movable part; and
an annular bent part is formed in the vicinity of an outer periphery of said movable part.

46. (Amended) ~~An~~ The ink supply unit according to Claim 12, wherein:

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a film member having both gas permeability and ink repellent ~~property~~ properties is
interposed between said capillary and said ink storage chamber.

Claims 60-71 are added as new claims.